

Appl. No. 09/935,510
Amendment and Response C
Reply to Office Action of Nov. 2, 2004

Amendments to the Abstract:

Please replace the Abstract for this application with the Abstract set forth below (additions underlined; deletions struck through):

A hearing aid device providing instantaneous gain compression for sound signals and adaptive control of nonlinear waveform distortion, the device comprising: (a) at least one bandpass nonlinearity (BPNL) amplifier comprising a first bandpass filter, a second bandpass filter, and a memoryless nonlinear (MNL) compressive audio amplifier configured to receive a sound signal from the first bandpass filter and provide an MNL compressive audio amplifier output to the second bandpass filter, wherein the MNL compressive audio amplifier is configured to produce the MNL compressive audio amplifier output by providing memoryless gain compression directly on a sound signal that is (1) received from the first bandpass filter and (2) exhibits instantaneous amplitudes greater than a compression threshold, the BPNL amplifier thereby producing a desired gain compression on the received sound signal at an output of the second bandpass filter, and (b) a controller in communication with the BPNL amplifier, the controller being configured to adjust the compression threshold of the MNL compressive audio amplifier. ~~In a hearing amplification device adapted to receive a sound signal, the hearing amplification device having at least one bandpass non-linearity (BPNL) channel configured to receive an input representative of said sound signal, the improvement comprising the channel being further configured with a memoryless nonlinear amplifier to provide (1) linear gain for an input representative of a portion of a subband of the sound signal having an instantaneous sound level less than a compression threshold, (2) instantaneous compressive gain for an input representative of a portion of a subband of the sound signal having an instantaneous sound level greater than the compression threshold, wherein the instantaneous compressive gain is less than the linear gain, and (3) adaptive control of the compression threshold. Adaptive~~ Adjustment of the compression threshold in each BPNL amplifier control may be achieved at least partially in response to a user input and/or to sound

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signal changes. By adaptively controlling the compression threshold, performance of the device can be optimized to match its environment.